

BEFORE
THE ILLINOIS COMMERCE COMMISSION

Commonwealth Edison Company	:	
	:	Docket No. 00-0259
Petition for expedited approval of	:	
implementation of a market-based	:	
alternative tariff, to become effective on	:	
or before May 1, 2000, pursuant to	:	
Article IX and Section 16-112 of the	:	
Public Utilities Act	:	
	:	(cons.)
Central Illinois Public Service Company	:	
Union Electric Company	:	
	:	Docket No. 00-0395
Petition for approval of revisions to	:	
market value tariff, Rider MV	:	
	:	
Illinois Power Company	:	
	:	Docket No. 00-0461
Proposed new Rider MVI and	:	
Revisions to Rider TC	:	

Joint Direct Testimony Of

PHILIP R. O'CONNOR

And

TOM BRAMSCHREIBER

On Behalf Of

NEWENERGY MIDWEST, L.L.C.

AUGUST 29, 2000

ILLINOIS
COMMERCE COMMISSION
AUG 30 10 53 AM '00
CHIEF CLERK'S OFFICE

1 Q. Please state your names and business address.

2 A. Philip R. O'Connor and Tom Bramschreiber. NewEnergy Midwest,
3 L.L.C., 29 South LaSalle Street, Suite 900, Chicago, Illinois 60603.

4 Q. Dr. O'Connor, by whom are you employed and in what position?

5 A. I am employed by NewEnergy Midwest, L.L.C., the regional subsidiary of
6 NewEnergy Inc., an AES Corp. subsidiary, in the position of President.

7 Q. Dr. O'Connor, please describe your educational background and business
8 experience.

9 A. Attached as (PRO-2) is a vita, which list my education and business
10 experience. I have been involved in the movement to competition in the electric
11 industry for over fifteen years. My involvement began with my service as
12 Chairman of the Illinois Commerce Commission, where, in 1984, we produced
13 one of the first papers advocating the use of competition as an alternative to cost
14 of service monopoly regulation in electricity. From 1986 to mid-1998, I was in
15 the consulting business with a concentration in energy and deregulation. The
16 consulting firm I founded, Palmer Bellevue Corporation was acquired by Coopers
17 & Lybrand in 1994. I left as a partner in Coopers & Lybrand mid-1998 to
18 become President of NewEnergy Midwest, L.L.C., one of the regional
19 subsidiaries of New Energy Inc. AES Corp. acquired NewEnergy in mid-1999.

20 Q. Mr. Bramschreiber, by whom are you employed and in what position?

21 A. I am employed by NewEnergy Midwest, L.L.C., the regional subsidiary of
22 NewEnergy Inc., an AES Corp. subsidiary, in the position of Manager of Product
23 Development.

1 **Q.** Mr. Bramschreiber, please describe your educational background and
2 business experience.

3 **A.** I hold a Bachelor of Science degree in Finance from Bowling Green State
4 University and a Masters of Business Administration degree in Finance from
5 DePaul University. I have been employed by NewEnergy since 1999. From 1994
6 to 1999, I was employed by MidCon Corp., a subsidiary of Occidental Petroleum
7 and later KN Energy, where I held various positions in retail and wholesale
8 energy marketing, supply procurement, and product development and planning.
9 From 1984 to 1994, I was employed by The Peoples Gas, Light & Coke
10 Company, a subsidiary of Peoples Energy, in various gas supply planning and
11 regulatory affairs positions.

12 **Q.** What is the purpose of this proceeding?

13 **A.** The purpose of this proceeding is to address the relative merits, on a
14 consolidated basis, of the market index proposals individually filed by
15 Commonwealth Edison Company ("ComEd"), Central Illinois Public Service
16 Company and Union Electric Company ("Ameren"), and Illinois Power Company
17 ("Illinois Power"). Each utility has proposed an alternative to the administratively
18 determined Neutral Fact Finder ("NFF") for calculating market values of energy
19 as set forth in Section 116-112 of the Public Utilities Act ("Act").

20 **Q.** What is the purpose of your joint testimony?

21 **A.** The purpose of our joint testimony is to discuss the use of a market index
22 for the determination of market value in lieu of the NFF. Our testimony will
23 focus on the importance of properly determining market value, including the

1 proper definition of “market”. In addition, our testimony will address the use of
2 electronic exchanges for establishing on-peak forward prices and our concerns
3 with the geographic limits of wholesale markets.

4 NewEnergy witness Michael Kagan will discuss some of the operational
5 and economic shortfalls found within the three market index proposals. Most
6 significantly these include the inappropriateness of using historical daily spot
7 transactions for establishing off-peak forward prices, the potential flaws of
8 applying an hourly PJM price shape to the Illinois market, and the missing but
9 necessary adjustments which should be made to reflect uncertainty of price and
10 retail load.

11 **Q.** Should the outcome of this proceeding be viewed as the final step in
12 bringing electric competition to Illinois?

13 **A.** No. The Illinois electricity market can not yet be considered liquid and
14 thus the outcome of this proceeding cannot reasonably be the final step in creating
15 true competition. Constant and ongoing review of the evolving competitive
16 market is crucial if competition is to be fostered.

17 **Determination Of Market Value**

18 **Q.** Why is the determination of market value so important?

19 **A.** For utilities seeking to collect transition charges, the determination of
20 market value is important for at least two reasons. First, market value is used in
21 the calculation of annual transition charges for those utilities seeking to collect
22 such charges. Second, market value provides the “benchmark” against which

1 alternative suppliers must ultimately compete when selling electricity behind a
2 utility that is collecting transition charges.

3 **Q.** How is market value determined?

4 **A.** The Act provides two separate methods for determining the market value
5 to be used in the calculation of transition charges. Market value can be
6 determined administratively through the NFF process, as was the case last Fall, or
7 market value can be determined through a market index methodology proposed
8 by a utility, as has been proposed in this consolidated proceeding.

9 **Q.** Does NewEnergy support the determination of market value based on a
10 market index methodology?

11 **A.** Yes. If properly reflective of the true cost of serving retail customers,
12 both operationally and economically, NewEnergy supports the use of a market
13 index methodology over that of the administratively determined NFF.
14 NewEnergy has previously indicated that the NFF process provides an inadequate
15 mechanism for calculating the market value of energy (*See*, NewEnergy's verified
16 comments in Docket No. 00-0259, Page 2). If properly designed, a market index
17 methodology will provide better price signals to the marketplace than the NFF.

18 It is important for all parties to acknowledge that there is no perfect
19 market index methodology. The Illinois electricity market is simply not
20 adequately liquid at this time. There are relatively few term transactions and there
21 is no hourly market on which to build a market index. Moreover, there is no
22 active Independent System Operator (ISO) and no actively traded futures or
23 regulated forward market. Because there is no pure forward-looking market in

1 Illinois, the index proposals filed to date have relied upon electronic exchanges
2 which are just developing or geographically located in other states for the purpose
3 of establishing on-peak forward prices, and have relied upon historical spot prices
4 for the purpose of establishing off-peak forward prices. Nevertheless, certain
5 facts and reasonable assumptions can be used to approximate the true cost of
6 serving retail customers.

7 **Q.** What happens if market value is set too high or too low?

8 **A.** If market value is set too high, transition charges will be set too low. All
9 things being equal, this would likely result in a large number of retail customers
10 choosing alternative suppliers and, consequently, the utility being unable to sell
11 electricity at volumes and prices reflected in designing its transition charges. In
12 short, the utility would likely experience a revenue shortfall.

13 Conversely, if market value is set too low, transition charges will be set
14 too high. All things being equal, this would likely result in virtually all retail
15 customers being served by the utility under historical bundled service or being
16 served by the utility under the Power Purchase Option (PPO). In short,
17 competition would not be fostered and, in fact, would not exist because alternative
18 suppliers would not be able to compete against the incumbent utility's price for
19 electric power and energy.

20 Given this delicate balance, it is critical that market value reflects the true
21 cost of serving retail customers.

Definition Of Market Value

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Q. How does the Act define market value under a market index methodology?

A. Section 116-112(a) of the Act defines market value, under a market index methodology, “as a function of an exchange traded or other market traded index, options or futures contract or contracts applicable to the market in which the utility sells, and the customers in its service area buy, electric power and energy” (220 ILCS 5/16-112(a)).

Q. How have the utilities defined market value under a market index methodology?

A. ComEd, for example, has argued in this case, as well as others, that market value represents the value of freed-up electricity that ComEd can resell as retail customers choose alternative suppliers.

“The market value to be used in the calculation of transition charges is intended to represent the value of the freed-up electricity that ComEd can sell when retail customers move to an ARES.” (Docket No. 00-0259; Direct Testimony of Arlene Juracek; Page 5).

“Market value, by definition, is the value to the electric utility of the electric power and energy that it can sell to somebody else that the utility formerly would have sold to its delivery service customers.” (Docket No. 99-0117; Surrebuttal Testimony of Paul Crumrine; Page 18).

“According to the Act, market value is the value to the utility of the power and energy that it formerly provided to retail customers that select delivery service and is freed up when those customers no longer purchase power and energy from ComEd.” (Docket No. 99-0171; Rebuttal Testimony of Paul Crumrine; Page 5).

“... the value to ComEd of being able to resell power and energy freed-up by customers choosing delivery service.” (Docket No. 99-0171; Surrebuttal Testimony of Robert McDonald; Page 5).

As discussed further below, the proposals, among other things, provide equal recognition to the value utilities can buy power and energy, thereby artificially depressing market values and artificially inflating transition charges. The market to which the market value is to apply should not include recognition of such utility purchases.

Q. How should market value be defined in this case?

A. The touchstone for establishing a market index is the language in the Act that requires market value “. . . be determined . . . as a function of an exchange traded or other traded index, options or futures contract or contracts applicable to the market in which the utility sells, and the customers in its service territory buy, electric power and energy” (emphasis added).

Accordingly, any market index methodology must relate to a definition of “market” that takes into account not merely the geographic dimension of a market definition but also, at a minimum, a product dimension of a market definition.

Retail customers buy retail power and energy that varies in price and quantity by hour, not fixed standard wholesale bulk blocks. When retail customers no longer purchase power and energy from the utility, the utility has the ability to resell retail power and energy that varies by hour, not simply standard wholesale blocks.

With rare exceptions, such as street lighting, retail customers have load shapes that rise in the morning, fall in the evening, and dip further in the early morning. Such characteristics must be properly reflected in any market index proposal.

Without proper adjustments to any raw “market values” drawn from wholesale data sources, there will be an inherent underestimation of the market

value of power and energy that can be sold by the utility and must be bought by retail customers. Any market index proposal should be evaluated on the basis of its capacity for proper adjustment to take into account the differences between the market providing the data (wholesale) and the market to which the data will be applied (retail). In addition, any market index proposal must also recognize other applicable rules or tariff requirements that must be complied with in serving retail customers (*e.g.*, scheduling, reserve margins, etc.). In short, market value must be reflective of the true cost of serving retail customers, both operationally and economically.

Q. What other key components of the Act are present beyond the “be determined” component just discussed?

A. There are three additional components to Section 116-112(a) of the Act that warrant note. These additional components are (i) “function of”, (ii) “customers in its service area buy”, and (iii) “electric power and energy”.

First, the Act states that an alternative determination of market value shall be “. . . . a function of” The word *function* is defined in the dictionary as something closely related to another thing and dependent on it for its existence, value, or significance (*See*, The American Heritage College Dictionary). The determination of market value can be closely related to and dependent on an exchange or market traded index, yet also contain appropriate adjustments. The Act does not state that market value will be an exchange or market traded index, just that market value will be a *function of* an exchange or market traded index.

1 Second, the Act states that an alternative determination of market value
2 shall be applicable to the market “. . . . in which the utility sells, and the
3 customers in its service area buy” It is a simple fact that retail customers buy
4 retail power and energy that varies by hour. Consequently, the market value
5 applicable to any utility must be reflective of the unique characteristics of retail
6 load, including this hourly fluctuation in load. Moreover, this portion of the Act
7 is clear that market value shall be determined based on the market in which the
8 utility sells electric power and energy. The Act makes no reference, whatsoever,
9 that market value shall be determined based on the market in which the utility
10 buys electric power and energy. Every transaction has a seller and a buyer; the
11 Act has clearly defined each of those as the utility (seller) and the customers in its
12 service area (buyer). This is crucial to defining the applicable market.

13 Third, the Act states that an alternative determination of market value shall
14 be reflective of “. . . . electric power and energy.” Each of the three market index
15 proposals fail to adequately reflect the *power* portion of this requirement when
16 establishing off-peak forward prices. As discussed further in NewEnergy witness
17 Michael Kagan’s testimony, each market index proposal has relied on historical
18 day-ahead spot transactions for establishing off-peak forward prices. Such
19 historical day-ahead spot transactions, sometimes referred to as “dump sales”, do
20 not adequately reflect the value of *power* associated with longer-term
21 transactions. None of the three proposals complies with this third component.

22 **Q.** What other applicable rules or tariff requirements must be complied with
23 in serving retail customers?

1 **A.** There are Illinois Commerce Commission (ICC) rules and delivery service
2 tariff requirements regarding “Good Faith Scheduling”. In addition, there are
3 Federal Energy Regulatory Commission (FERC) transmission service tariff
4 requirements regarding the use of transmission systems. All applicable rules and
5 requirements must be reflected in the determination of market value or market
6 value will be understated, with transition charges overstated, and competition will
7 not develop. Absent the ability to replicate native load service, both operationally
8 and economically, customers will be left only with a choice between utility
9 provided bundled service and utility provided PPO service. Such a result does not
10 foster competition under any standard or measure.

11 **Q.** What is the ICC rule and delivery service tariff requirement regarding
12 Good Faith Scheduling you previously mentioned?

13 **A.** Suppliers are required, at all times, to schedule in good faith. This is an
14 ICC rule and a delivery service tariff requirement. *See*, 83 Ill. Admin. Code
15 Section 451.20(a) (ICC Rule); Ill. C. C. No. 4, Original Sheet No. 166 (ComEd
16 Rate RESS); Ill. C. C. No. 14, Original Sheet No. 10.015 (Central Illinois Public
17 Service Company Rate RES); Ill. C. C. No. 7, Original Sheet No. 52 (Union
18 Electric Company Rate RES); and Ill. C. C. No. 31, Original Sheet No. 56.0008
19 (Illinois Power Company Service Classification 110).

20 ComEd’s *Open Access Implementation Plan* defines this Scheduling
21 Requirement as,

22 “Retail Electric Suppliers and Customer Self-Managers must schedule and
23 provide generation matching the end-use customer’s actual loads plus
24 applicable transmission and distribution losses at all times.” (Page 86 of
25 March 1, 1999 filed plan).

Ameren's *RES Handbook* defines Forecasting for Energy Scheduling as,

"The TSA must first forecast the hour by hour load of its retail customers for a given day. . . . Once the TSA has developed the forecast, it is obligated to submit an energy schedule that is a 'good faith' representation of that forecast. The TSA may not deliberately under schedule or over schedule the forecast of load to create energy imbalances that it deems favorable." (Pages 8 and 9 of RES Handbook).

Illinois Power's *RES Handbook* defines Scheduling Accuracy Requirements as,

"TSAs are responsible for providing 'good faith' day-ahead energy schedules reflective of the expected load." (Page 47 of RES Handbook dated April 12, 2000).

Based on reasonably available data, and using an objectively reasonable load forecasting methodology, suppliers are required to submit schedules designed to minimize the difference between hourly forecasted usage and hourly scheduled quantities at all times. In short, suppliers must schedule hourly following their retail customers' forecasted load up and down throughout the day, regardless of price (*i.e.*, can not routinely and continually schedule standard wholesale blocks to serve retail load).

This hourly price and usage uncertainty must be reflected in any market index proposal. Suppliers simply are not permitted to rely on imbalance service as a means to *shape* standard wholesale blocks. Although imbalance service is a transmission ancillary service, hourly scheduling to an uncertain and daily changing forecast is a supply cost. NewEnergy witness Michael Kagan will discuss the need for such an "optionality" adjustment to reflect price and usage uncertainty.

Q. What are the transmission tariff requirements you previously mentioned?

1 **A.** Unlike ComEd, Ameren and Illinois Power apparently do not consider
2 marketer firm agreements, with liquidated damages, to have the same firmness as
3 native load in terms of transmission priority (*i.e.*, have made a distinction between
4 financially firm versus native load firm). However, that is precisely the type of
5 financial agreement they have proposed to use in establishing on-peak forward
6 prices via the Altrade and Bloomberg electronic exchanges.

7 Neither Ameren nor Illinois Power has adequately reflected this
8 transmission tariff “requirement” within their market index filings. This is an
9 obvious mismatch between the calculated market value to serve customers, which
10 is the exercise of this proceeding, and the actual cost for an alternative supplier to
11 physically serve customers. Again, unless suppliers can replicate the quality of
12 native load service, at the price reflected in the market value calculation,
13 competition will not develop and customers will be left only with a choice
14 between utility provided bundled service and utility provided PPO service.

15 **On-Peak Forward Prices**

16 **Q.** Can you briefly describe the methodology used by the three utilities for
17 establishing on-peak forward prices?

18 **A.** Yes. All three proposals rely on the Altrade and Bloomberg electronic
19 exchanges for capturing forward prices for standard wholesale blocks (5 x 16
20 wholesale blocks). Included in these electronic exchanges are financially firm
21 wholesale products consisting of both power and energy. ComEd has relied on an
22 “into ComEd” hierarchy, while Ameren and Illinois Power have relied on an “into

1 Cinergy” hierarchy with historical locational adjustments to translate southern
2 Ohio information to southern Illinois.

3 **Q.** Do you support ComEd’s methodology for establishing on-peak forward
4 prices?

5 **A.** NewEnergy supports use of a methodology based on “into ComEd” rather
6 than a methodology based on “into Cinergy” plus a basis or location adjustment.
7 NewEnergy previously objected to the use of a non-representative market index
8 as part of the market value calculation and subsequent market activity has
9 demonstrated that the ComEd and Cinergy markets are relatively independent. In
10 addition, ComEd’s methodology provides a better representation of the large
11 seasonal differences in market prices for power and energy than has been
12 previously reflected in the administratively determined NFF.

13 However, NewEnergy does have concerns with the lack of completed
14 transactions as well as the large number of postings that are made by ComEd
15 itself. Caution with regard to manipulation must be taken when using unregulated
16 electronic exchanges where the utility is the primary poster (*i.e.*, setting its own
17 market index).

18 In addition, absent any actual transactions, ComEd’s daily hierarchy uses
19 the midpoint of the paired bids and offers for a given time of day (Original Sheet
20 No. 151.3). The midpoint of paired bids and offers represents the range between
21 the bid (offer to buy power and energy) and the offer (offer to sell power and
22 energy). Use of the midpoint of the paired bid and offer provides equal weighting
23 to both an offer to buy and an offer to sell. Given that ComEd is virtually the lone

1 poster of bids and offers, and the absence of virtually any actual transactions, that
2 portion of ComEd's daily hierarchy should be modified to reflect:

3 The average of the offers to sell reflected in the morning offer price and
4 the afternoon offer price, where both bid and offer prices must be
5 simultaneously listed for a particular forward contract, for a given time of
6 the day.

7
8 In this way, the market index will reflect what ComEd is willing to sell power and
9 energy, which is presumably its value.

10 **Q.** Do you support Ameren's or Illinois Power's methodology for
11 establishing on-peak forward prices?

12 **A.** No. Use of a Cinergy-type index plus a historical locational adjustment
13 requires a statistical analysis demonstrating a relevant and sustained correlation
14 between Cinergy and the two Illinois geographic markets. It may well be that
15 Cinergy and the two Illinois utility markets will prove to be reasonably
16 interdependent or correlated. However, if they are relatively independent, great
17 caution must be exercised in the use of a simple basis differential or locational
18 adjustment. Ameren and Illinois Power must be required to come forward with
19 such analyses. The Act requires an empirical demonstration of the applicability
20 of the geographic index to a specific market.

21 As previously noted, both Ameren and Illinois Power have made a
22 distinction between financially firm versus native load firm. What is troubling
23 about each of their index proposals is that even if a supplier could perfectly *mimic*
24 the components of their index proposals, at the exact same market cost, the
25 resulting supply portfolio would not have the same level of firmness as native
26 load. In particular, Ameren and Illinois Power require suppliers to "point to iron

1 on the ground” (*i.e.*, designate specific generation resources), and do not allow
2 suppliers to use financially firm (sometimes called marketer firm with liquidated
3 damages) as a designated network resource. To rely on financially firm on-peak
4 products to establish market value, while holding such financially firm on-peak
5 products to a lower level of firmness as native load, is incongruous at best.

6 **Conclusions**

7 **Q.** Having stated the above, do you support ComEd’s proposal as filed?

8 **A.** No. However, the important differences NewEnergy has with ComEd’s
9 proposal are more of a “fine tune” in nature. NewEnergy could likely resolve all
10 of its issues with ComEd in short order if the discussion were among business
11 people unhindered by litigation posturing.

12 **Q.** Having stated the above, do you support Ameren’s or Illinois Power’s
13 proposals as filed?

14 **A.** No. For the reasons noted above, NewEnergy does not support either
15 proposal as filed. Both proposals fall woefully short of reflecting the market in
16 which customers in their service territories buy electric power and energy. This is
17 true from an operational as well as an economic viewpoint. As a result,
18 competition will remain non-existent in these two service territories and their
19 proposals should be summarily rejected. Neither Ameren nor Illinois Power has
20 presented adequate empirical information to support their proposals.

21 **Q.** Are the utilities required to accept any changes to their filed proposals?

22 **A.** No. The utilities have been afforded the unusual opportunity under the
23 Act to “take their ball and go home” if they so choose. If the ICC orders changes

1 that are not acceptable to the utility, under the Act the utility may simply opt for
2 the administratively determined NFF for establishing market value. To the extent
3 such action results in all customers choosing between utility provided bundled
4 service or utility provided PPO service (*i.e.*, re-monopolize the market), then it
5 would behoove the ICC to seek future legislative changes in the Act to foster
6 competition.

7 **Q.** Does this conclude your joint testimony?

8 **A.** Yes.

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Dr. O'Connor is nationally recognized as an expert on the development and implementation of competitive strategies in regulated industries. He is a frequent speaker, both nationally and internationally, on utility and insurance issues and has authored numerous articles in professional trade journals. Prior to joining NewEnergy, he was a partner with Coopers & Lybrand Consulting, into which he had merged his own firm, Palmer Bellevue Corporation in, 1994. Previously, Dr. O'Connor served as Illinois' chief utility regulator, chairing the Illinois Commerce Commission, and served as Director of the Illinois Department of Insurance.

Employment:

President, NewEnergy Midwest, L.L.C., an AES Company] (1998-Present)

Principal/Partner, Coopers & Lybrand Consulting/Palmer Bellevue (1995-1998)

Managing Director, Palmer Bellevue, a Division of Coopers & Lybrand (1994-1995)

President and Chairman, Palmer Bellevue Corporation (1986-1993)

Chairman, Illinois Commerce Commission (1983 - 1985)

- Member, National Association of Regulatory Commissioners (1983-1985)

Director, Illinois Department of Insurance (1979 - 1982)

- Member, National Association of Insurance Commissioners (NAIC) (1979-82)

Assistant to the Director and Deputy Director for Research and Urban Affairs,
Illinois Department of Insurance (1977 - 1979)

Administrative Assistant to U.S. Representative George Miller
(7th District California) (1974 - 1977)

Assistant to California Senate Majority Leader, George Moscone (1973 - 1974)

Administrative Aide to Illinois Governor Richard B. Ogilvie (1969 - 1973)

Public and Political Service

Political Director, Citizens for Governor Thompson (1982 - 1983)

Chairman, U.S. Environmental Protection Agency Allowance Tracking & Trading Subcommittee of the Acid Rain Advisory Committee (1991-1992)

General Chairman, Citizens for Governor Edgar (1994)

Chairman of the Illinois Health Care Reform Task Force (1993-1994)

Chairman of the Illinois Task Force on Human Services Consolidation (1996-1998)

Member, Illinois State Board of Elections (1998-Present)

Member, Children and Families Transition Committee to Governor-Elect George H. Ryan (1998)

Chairman, Interim Board of the Illinois Insurance Exchange (1998)

Education

1966 - 1968	University of San Francisco
1968 - 1969	Loyola University of Chicago, Rome Center for Liberal Arts
1969 - 1970	Loyola University of Chicago, A.B. <i>Magna Cum Laude</i>
1971	Northwestern University M.A. Political Science <i>Co-optation: A Re-definition and the Case of Chicago</i>
1979	Northwestern University, Ph.D. Political Science Dissertation: <i>Metrosim/A Computer Simulation Model of U.S. Urban Systems</i>

Academic

1997	Co-Instructor with Professor Alan Gittleson, <i>Money, Media, Message, Measurement & Motivation: Political Campaigns in the 90s</i> , an upper division undergraduate course in Political Science.
1997 & 1998	Instructor, <i>The Politics of Deregulation</i> , a five-week mini-course at the Kellogg Graduate School of Management at Northwestern University